

Petal Pushers



An Inquiry Science Investigation at the Presidio Nursery

Overview

How do plants reveal their secrets?

This essential question frames *Petal Pushers* and is meant to allow students to engage in place-based inquiry science at the Presidio Nursery. The essential question:

1. Reflects the essence of what they will study without directing them to one correct answer.
2. Provokes “how” or “why” questions rather than “what” questions.
3. Applies to places beyond Muir Woods.
4. Invites discussion from everyone based on both experience and understanding.

Students conduct their own science investigation in which they gain a stronger understanding of plant life cycles and adaptations through inquiry. Students pose questions, search for evidence, write narratives, and suggest explanations. The program provides a tangible model for students to explore indigenous plant communities through learning activities in the classroom and in a National Park (the Presidio of San Francisco).

Program Goals

- Enrich their understanding of place through inquiry.
- Experience National Parks as places for learning and recreation, and develop a personal connection to their local national park.
- Understand the uniqueness of the Presidio indigenous plant habitat.

Program Objectives

- Students will be able to pose questions from their own observations.
- Students will be able to plan and conduct experiments.
- Students will be able to explain how plants adapt for survival in the Presidio.
- Students will be able to report findings.



Ties to the Curriculum – Next Generation Science Standards and CA Common Core Standards for 3rd grade.

Next Generation Science Standards:

3-LS4-2: How the variation in characteristics among individuals of the same species may provide advantage in surviving, finding mates, and reproducing.

3-LS4-3: In a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

California's Common Core State Standards:

Speaking and Listening:

1.3: Engage effectively in a range of collaboration discussions (one-on-one, in groups, and teacher led).

Writing Standards:

2: Write explanatory texts...

3.3: Write narratives to develop real or imagined experiences or events.



Program Logistics

Please take careful note of the following:

- The teacher and chaperons are ultimately responsible for the conduct safety of the students.
- Clothing appropriate to the nature of the activities and weather conditions at the park is required. Advise students to dress in layers to accommodate the variable temperature characteristics of the Presidio. The program will be conducted regardless of weather conditions.
- Arrangements can be made to accommodate students with special needs. Please discuss specific circumstances with National Park Service or Conservancy staff prior to your visit.
- Please distribute the parental approval forms and photo/video release forms to students at least a week before the Nursery visit.

Rules and Regulations

There are park rules and regulations that your class should be made aware of before their visit. Please share the following rules with them:

- No plants or other natural features can be removed from the Presidio Nursery or any other area with the Golden Gate National Parks.
- Feeding or disturbing animals is not allowed.
- Portable radios, musical instruments, and electronic games will not be allowed during the field session.

Cancellation Policy

Please let us know of any changes in rescheduling your program dates. Because of the volume of schools participating, there is little room to reschedule your original date. Please plan accordingly.



Directions to Presidio Nursery

Most classes will be taking buses to The Presidio Nursery. Please make sure that bus drivers are familiar with the route.

Address: 1249 Appleton Street, Presidio of San Francisco, CA 94129

From the Golden Gate Bridge heading south:

1. Take the exit towards 25th Ave immediately after the toll booths
2. Merge onto Merchant Rd
3. Cross Lincoln Ave. and continue onto Storey Ave (Merchant Ave. becomes Storey Ave.)
4. Go past the ball field on your right
5. Storey Ave turns slightly right and becomes Upton Ave
6. Turn left onto Ruckman Ave
7. Take the first right onto Appleton St
8. Take the first left to stay on Appleton St (it looks like an alley just before the large white houses begin) Follow the road downhill
9. The nursery is on the right below the large warehouse buildings, and across the large white houses

From 19th Ave heading north:

1. Head north on 19th Ave towards the Golden Gate Bridge
2. Continue onto Crossover Dr.
3. Continue onto Park Presidio Bypass Blvd (you will be crossing through Golden Gate Park)
4. Continue onto Park Presidio Blvd
5. Continue onto Veterans Blvd
6. Continue onto US- 101N
7. Take the last San Francisco exit toward Presidio/Golden Gate National Parks
8. Turn right to enter the Presidio of San Francisco/Golden Gate National Parks
9. Turn right onto Lincoln Blvd
10. Turn left on Storey Ave
11. Storey Ave turns slightly right and becomes Upton Ave
12. Turn left onto Ruckman Ave
13. Take the first right onto Appleton St
14. Take the first left to stay on Appleton St (it looks like an alley just before the large white houses begin) Follow the road downhill

15. The nursery is on the right below the large warehouse buildings, and across the large white houses

From the Bay Bridge I-80 W heading north US-101N:

1. Follow signs for U.S. 101 N/Golden Gate Bridge and merge onto US-101 N
2. Exit onto US-101N/Mission St toward GG Bridge
3. Turn left onto S Van Ness Ave
4. Turn left onto Lombard St
5. Continue onto US-101/Richardson Ave
6. Take the last San Francisco exit toward Presidio/Golden Gate National Parks
7. Turn right to enter the Presidio of San Francisco/Golden Gate National Parks
8. Turn right onto Lincoln Blvd
9. Turn left on Storey Ave
10. Storey Ave turns slightly right and becomes Upton Ave
11. Turn left onto Ruckman Ave
12. Take the first right onto Appleton St
13. Take the first left to stay on Appleton St (it looks like an alley just before the large white houses begin) Follow the road downhill
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<http://www.parksconservancy.org/get-involved/volunteer/drop-in-programs/presidio-nursery.html>

Bus service

1. MUNI line 28 direction: Fort Mason
2. Get off at Golden Gate Bridge toll plaza, and either walk or take free Presidio Shuttle:

Walking

1. Walk under the tunnel and turn left onto Cranston Rd
2. Turn right onto Merchant Road up the hill
3. Cross Lincoln Ave, and continue onto Storey Ave (Merchant Rd becomes Storey Ave)
4. Go past the ball field on your right
5. Storey Ave turns slightly right and becomes Upton Ave
6. Turn left onto Ruckman Ave
7. Take the first right onto Appleton St
8. Take the first left to stay on Appleton St (it looks like an alley just before the large white houses begin) Follow the road downhill

9. The nursery is on the right below the large warehouse buildings, and across the large white houses
The walk takes approximately 10-15 minutes.

Or free Presidio Shuttle: Crissy Field Route

If you don't want to walk from the Golden Gate Bridge, you may take the free Presidio Shuttle: Crissy Route. It picks up from the toll plaza every 30 minutes. The shuttle stop is across the street where the MUNI 28 drops off; it will be approximately a 25 minute ride.

1. Get off at the corner of Ruckman Ave. & Upton Ave. Then walk downhill on Ruckman Ave
2. Take the first right onto Appleton St
3. Take the first left to stay on Appleton St (it looks like an alley just before the large white houses begin) Follow the road downhill
4. The nursery is on the right below the large warehouse buildings, and across the large white houses



Program Description – Petal Pushers

The program has three elements: pre-visit classroom lessons guided by the teacher (materials provided by Presidio Nursery); a field session at The Presidio Plant Nursery facilitated by NPS and Golden Gate National Parks Conservancy Staff; and suggested post-visit lessons guided by the teacher.

Perspectives – Teacher Facilitated Lessons

Students are introduced to the program by exploring the essential question “How do plants reveal their secrets?” In their journal, they share their prior knowledge about plants, and what they wish to learn about them. This lesson is followed by the Petal Pushers video, which introduces students to the Presidio Nursery. While continuing with their journals, students review the different parts of a plant and their life cycles by dissecting a seed. Finally, the lessons are completed by guiding students through the Scientific Method.

Time

Determined by class

Materials

Student journals (provided by Presidio Nursery)

Pencils

Presidio Nursery Video

Colored Pencils

Lima bean seeds (provided by Presidio Nursery)

Clear tape

“Jack and the bean stalk” activity (found as a separate handout in the Teacher CD provided by NPS)

Clear plastic cup

Paper towel, or cotton balls



Teacher Facilitated Lessons (Pre-Site Activities)

Activity 1:

Teacher introduces the students to the Petal Pushers Program by posing the essential question on the board: How do plants reveal their secrets?

Before asking the students to answer the question, students define the words reveal and secrets. After students define the concepts, they answer the question in pairs, in a group, or with the entire class.

Introduce the students to their journal. Ask them to fill in their name and list 5 things they know about plants and 3 things they would like to learn on pages 2-3.

Activity 2:

Show students the Petal Pushers video and answer the questions on pages 4-5.

Activity 3:

Teachers reinforce prior knowledge by discussing different parts of a plant on pages 6-7.

Teachers continue by guiding activity: What are seeds? Found on pages 8-9 (seeds provided by Presidio Nursery).

Activity 4:

Teachers introduce students to the scientific method by completing pages 10-11.

Conduct activity "Jack and the bean stalk" while guiding students through the scientific method on pages 12-15.



Presidio Nursery Field Session

Summary

Students engage in scientific inquiry through experiential learning activities facilitated by NPS and Presidio Nursery staff. Students use their senses while investigating the essential question; they record their observations, questions, identify plant life cycles and adaptations of the Presidio indigenous plants.

Time

3 hours (10:00am-1:00pm)

Investigating the secrets of plants at the Presidio Nursery

NPS and Presidio Nursery staff welcomes the students and reviews the safety rules. Staff then leads the students to the Presidio Nursery Habitat Demonstration Garden. Students will observe indigenous plants in different plant habitats, while asking and recording questions about organisms and events that they observe in the environment. In addition, students will take a closer look at the different types of indigenous seeds and learn about seed dispersal while they are reinforcing their understanding of plant life cycles and adaptations.

Students use their journals to record their findings at the Presidio Nursery. They are provided with materials, such as hand held magnifying glasses, to assist them in the exploration. They also will recognize the elements of identification that they explored and discussed in the classroom lessons.

Students will pick two to three investigable questions they recorded earlier; break into groups and plan and conduct a simple investigation. Students then communicate their investigations and explanations to one another by drawing, speaking, or writing what they find.



Post-Visit Classroom Lessons

These follow-up activities are designed to build upon the students' inquiry experience at the Presidio Nursery. Students can demonstrate what they have learned during their experience by completing their journal and the following activities:

Students choose a part of a plant (leaves, roots, stems, flowers...). Ask students to write and illustrate a poem that shows the adaptations of this plant part. Encourage students to use descriptive words and information from their journal.

And/or

Students create their own story of how plants have adapted to the changing environment in the Presidio.



Assessment

An inquiry approach to the pre-visit classroom activities improves the field program: Students are focused on the careful inquiry of indigenous plant life, searching for explanations for their questions, and are able to consider the essential question with greater confidence. We are able to conduct a simple assessment of students' understanding at the end of the field program by reviewing their notebooks in which students have written their questions, responses, and reflections.

- 1. Name a step in the scientific method.**
- 2. Name two plant adaptations.**
- 3. Share something new that you learned today.**

Further assessment is available to the teacher when students return to class and complete one of the post-visit lessons.